



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

But this is the same chance as that which was found above in different terms. Equating the two, we have

$$\frac{p! m(abc\dots)}{l^p} = \frac{n!(p-1)!}{(n-p)!(n+p-1)!}.$$

$$\text{Hence, } m(abc\dots) = \frac{l^p \cdot n!(p-1)!}{p!(n-p)!(n+p-1)!}.$$

For the case $p=n$ this value reduces to $\frac{l^n(n-1)!}{(2n-1)!}$, the mean value of the product of the n segments of the line. This result agrees with that found by Mr. Crofton in the solution of the latter problem in the *Encyclopedia Britannica*, Vol. XIX, p. 784.

This solution should have appeared instead of the solution published last month. Both solutions were received before the last issue went to press. By an oversight the defective solution got in with the material for publication. Ed. F.

170. Proposed by LON C. WALKER, Santa Barbara, Cal.

Find the area of a triangle formed by drawing a line at random through each of three points taken at random within a given triangle.

No solution has been received.

174. Proposed by J. EDWARD SANDERS, Reinersville, Ohio.

A chord of length C is drawn at random in a given ellipse. What is the average area of the segment cut off by the chord?

Solution by G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.

Refer the ellipse to conjugate diameters so that $x^2/m^2 + y^2/n^2 = 1$ is its equation.

$$\begin{aligned} \text{Area of segment} &= \frac{2n}{m} \sin \omega \int_{(m/2n)\sqrt{(4n^2-c^2)}}^m \sqrt{(m^2-x^2)} dx \\ &= mns \sin \omega \left[\cos^{-1} \left(\frac{\sqrt{(4n^2-c^2)}}{2n} \right) - \frac{c \sqrt{(4n^2-c^2)}}{4n^2} \right] \\ &= ab \left[\cos^{-1} \left(\frac{\sqrt{(4n^2-c^2)}}{2n} \right) - \frac{c \sqrt{(4n^2-c^2)}}{4n^2} \right] = A. \end{aligned}$$

ω is the inclination of m, n .

$$\text{Average area is } \Delta = \frac{\int_b^a A dn}{\int_b^a dn}.$$

$$\therefore \Delta = \frac{ab}{a-b} \left[a \cos^{-1} \left(\frac{\sqrt{(4a^2 - c^2)}}{2a} \right) - b \cos^{-1} \left(\frac{\sqrt{(4b^2 - c^2)}}{2b} \right) + \frac{c}{4} \left(\frac{\sqrt{(4a^2 - c^2)}}{a} - \frac{\sqrt{(4b^2 - c^2)}}{b} \right) \right].$$

Corollary. If $a=b$, $\Delta = a^2 \left[\cos^{-1} \left(\frac{\sqrt{(4a^2 - c^2)}}{2a} \right) - \frac{c \sqrt{(4a^2 - c^2)}}{4a^2} \right]$.

PROBLEMS FOR SOLUTION.

ALGEBRA.

275. Proposed by PROF. R. D. CARMICHAEL, Anniston, Ala.

Given the simultaneous equations $xy - y^x = 0$ and $y - x = a(a+1)^{1/a}$; find a solution which is real when $a > -1$.

276. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.

If $x_1, x_2, \dots, x_n$ be unequal and $f(n)$ be a rational integral function of degree $\geq n-2$, then shall

$$\sum_{r=1}^{n-1} \frac{f(x_r)}{(x_r - x_1)(x_r - x_2) \dots (x_r - x_n)} = 0.$$

277. Proposed by G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.

If $\alpha, \beta, \gamma, \delta$ are the roots of the quartic $ax^4 + bx^3 + cx^2 + dx + e = 0$, calculate the value of the product of the twelve expressions of the form $(4\alpha - 2\beta - \gamma - \delta)$ in terms of H, I, J , the well known functions of the differences of the roots.

GEOMETRY.

306. Proposed by J. SCHEFFER, A. M., Kee Mar College, Hagerstown, Md.

Find the length of the perpendicular let fall from the point in space (5, 6, 7) upon the line $x=2z-3$, and $y=-3z+1$.

307. Proposed by WALTER D. LAMBERT, 416 B Street N. E., Washington, D. C.

A family of planes containing a common line intersects a sphere. Find the orthogonal trajectories of the traces. An analytic solution is preferred.

308. Proposed by W. J. GREENSTREET, M. A., Editor of the Mathematical Gazette, Stroud, England.

Find the locus of O , if the differences of the squares of tangents from it to circles A, B, C are x^2, y^2, z^2 , respectively.